ENCLOSURE -
FIRST TECHNICAL NOTICE OF DEFICIENCY REGARDING JANUARY 12, 2010 AMENDMENT APPLICATION FOR LICENSE NO. R04100

The Texas Commission on Environmental Quality (TCEQ) comments regarding deficiencies and requested action items are grouped under each applicable appendix of the minor amendment application as submitted.

I. Deficiencies regarding Appendix 1 of WCS' Minor Amendment Application

The following are general deficiencies related to the amendment application and Appendix 1:

1. There is no updated, comprehensive, conceptual hydrogeological model in the amendment application to support the requested revisions of the license and incorporate the pre-construction studies, verification and monitoring performed on the site. Please provide an updated comprehensive, conceptual hydrogeological model. Any new hydrogeological model must take into account the recently observed (December 2009 – March 2010) water increases in the Ogallala-Antlers-Gatuña (OAG) wells in the vicinity of the planned disposal facilities.

2. There is no information provided in the amendment application on the status of current groundwater issues, such as the Dockum trapped air theory, and the value of the matric potential work. Please provide information, studies, and/or any documentation to explain and support the current position and/or groundwater issues.

3. Please provide boring log and well construction information for OAG wells GW-5, GW-1, and GW-1a.

4. Please provide boring log and well construction information for PW-1 and PW-7. Also, please include all available groundwater measurement taken on the site and include these wells in the monthly OAG groundwater level measurement report. Please provide any information regarding the intended use and pumping rates of PW-1 and PW-7. In addition, please provide all groundwater measurement data and pumping data for the Stock West, Stock East, and RH #1 wells.

5. Please provide all available groundwater measurement data from all 225-foot zone wells, 180-foot zone wells, 125-foot zone wells, and any additional Dockum wells collected since data provided in the May 2007 revision of the license application.

6. Please provide any available additional geologic information relating to Dr. Paine's recent electromagnetic (EM) survey results, as well as a list of wells/borings in which TCEQ and its consultants can participate in well and boring gamma/resistivity logging.

7. Please evaluate the feasibility of integrating the groundwater monitoring programs from the various licenses/permits at the WCS site. It is suggested that an integrated site-wide monitoring program would simplify and reduce the effort of the sampling program and provide for a more comprehensive monitoring program of the site.

8. Please prepare a plan to conduct a pump test, as previously discussed, on select wells completed in the 225-foot zone and the 180-foot zone and monitor the effects on adjacent wells/nearby wells. These pump tests should be used to help evaluate and be used as part of the demonstration of the appropriate sample collection methods for groundwater.

9. It is noted that several OAG wells, and possibly other wells and borings, have been recently plugged on the WCS site. Any future plugging activities of wells should be done only after pre-notification and coordination with TCEQ.

10. The documentation provided to TCEQ indicates that the central industrial well has been plugged and abandoned. This well was previously used as source for industrial/construction water. Please provide information regarding alternative sources of water used, or to be used, to replace that water that was provided from the central industrial well.

11. Please provide an update on the status of well CP-975 (current status, completion zones, and potential uses).

12. Please provide electronic copies of the photomicrographs in the December 2009 Petrographic Examination of Selected Samples from CP-975 document. In addition, please provide an electronic copy of any thin section petrographic examinations of Dockum material from cores taken in support of TCEQ radioactive waste disposal licenses.

13. Please provide water quality information and an age date for the Southeast supply (Trujillo sand) well.

14. The following are specific to the amendment application as submitted to TCEQ:

a) Regarding License Condition (LC) 165.F: The amendment application has proposed changes in italics. The TCEQ proposes additional changes and has provided strike-through of some proposed language and highlighted new language to be consistent with previous review/comment memoranda regarding the environmental monitoring program, leak detection and spill monitoring, consistent with LC 51.H. and 51.I. The TCEQ changes are provided below:

Monitoring Well Installation. All monitoring wells must be constructed and maintained in accordance with the requirements of the Texas Occupations Code, Chapter 1901 and in accordance with *American Society for Testing and Materials* (ASTM) ~~*D 448-85a (1992)*~~ *D092 - 04[e1] Standard Practice for Design and Installation of Ground Water Monitoring Wells.* Monitor well clusters will consist of one (1) well screened at the top of the 225-foot layer, one (1) well screened at the bottom of the 225-foot layer, and one (1) well screened at the bottom of the 125-foot layer. ~~*Testing must be performed on unfiltered samples and samples filtered with a 0.45 micron membrane filter*~~.

In addition, quarterly subsurface monitoring for the presence of water must be performed around the following on-site structures:

- Compact Waste Facility (CWF) Waste Staging Building;
- CWF Vehicle Decontamination Building;
- Federal Waste Facility (FWF) Bulk Container Staging Building;
- FWF Waste Staging Building;
- FWF Vehicle Decontamination Building;
- FWF Contact Water Tanks; and
- FWF Laboratory.

Where unsaturated conditions exist underneath these structures, lysimeters must be installed around these features in accordance with ASTM D4696-92 (2008) "Standard Guide for Pore

Liquid Sampling from the Vadose Zone" to monitor for possible spills and leaks. Where saturated conditions exist underneath these structures, monitoring wells must be installed to allow for detection of potential releases. These lysimeters and wells must be added to Attachment A and B, sampled quarterly as a grab sample, and analyzed for a minimum of gross alpha, gross beta, alpha isotopic, and liquid scintillation.

Please note that these structures are listed under the column titled System Identification – Building/Area" in WCS "Spill Control and Monitoring Table" submitted to the TCEQ on August 11, 2009 as required by LC 51.H. and as Addendum No. 2 to the Radiological Environmental Monitoring Program (REMP).

b) Regarding LC 165.H.(1): The amendment application has proposed the following changes in italic font. The TCEQ has changes to proposed language as indicated by strike-through of proposed language and highlighted new language to be consistent and to clearly describe the method by which samples are to be collected. Related to these revisions, during the November 2009 WCS sampling event, the TCEQ observed well sampling by WCS staff. Based on those observations, there have been discussions and concerns raised that some wells were not properly purged prior to sampling, where sufficient volume existed to do so, and that monitoring parameters were not taken and recorded at regular intervals in actual practice in the field. The TCEQ changes are provided below:

~~Water sampling must be in accordance *with* ASTM D 4448 *85a 01*.~~ For the collection of representative groundwater samples, the Licensee shall allow for parameter stabilization during the purging process prior to sample collection, monitor water quality parameters (conductivity, pH, and temperature) and sample according to ASTM D 4448-01 Standard Guide for Sampling Ground-Water Monitoring Wells. ~~Prior to sampling, wells must be pumped down.~~ Samples must then be acquired from the well by a pump or by lowering and filling a sample bailer with well water and then transferring the water to a sample container. All parameter readings must be recorded during purging and collected at regular intervals. Stabilization is achieved when at least three consecutive readings are taken at 3 to 5 minute intervals and are within tolerances stated in ASTM D 4448-01. When sufficient recharge of water exists, wells will be purged before a sample is collected. If documented insufficient recharge of water exist or other factors make purging and/or sampling impractical, the conditions and reasons must be documented and available for review by the Executive Director.

c) Regarding LC 165.H.(2): The amendment application has proposed the following changes in italic font. As provided below, the TCEQ has changes to proposed language as indicated by strike-through of proposed language and highlighted new language:

~~*For water wells that cannot be sampled according to ASTM D 4448 85 because of low flow conditions in the well where*~~ For *well-specific conditions (i.e., rate of recharge, water ~~quality~~* quantity, *etc.) ~~render~~* where *low-flow sampling techniques* are ~~in~~ *appropriate*, sampling method ASTM D 6771-02 Standard Practice for Low-Flow Purging and Sampling for Wells and Devices Used for Ground-Water Quality Investigations or US EPA technical guidance on Low-Flow Purging and Sampling (1996) must be used for sampling methodologies *for any wells ~~located within the Land Disposal Facility~~* listed in Attachment A, B, or C. The following parameter~~s~~ readings will be recorded as specified in ASTM 06771-02 for determining stabilization:

d) Regarding LC 165.H.(7): The amendment application has proposed the following changes in italic font. As provided below, the TCEQ has changes to proposed language as indicated by strike-through of proposed language and highlighted new language:

> For all radiochemical analysis, water samples will not be filtered in the field and *will not be ~~immediately~~* acidified in the field prior to shipping to the laboratory, unless filtering and acidification is required by a specified analytical method. Filtering will be required by the laboratory when the sample contains sediment that certain radionuclides of interest can partition to the sediment, in which case, both the water and the sediment will be analyzed. Container type and size will also be determined by the analytical method.
>
> For all chemical analysis, water samples ~~must~~ will not be filtered in the field and will be preserved according to the analytical method requirements. Container type and size will also be determined by the analytical method. Filtering will be required by the laboratory when sample contains sediment that certain chemical analytes of interest can partition to the sediment, in which case, both the water and the sediment will be analyzed.

II. Specific Deficiencies regarding Proposed Revisions to License Attachments A and B

1. The amendment application proposes to add "*other approved methods*" to most of the rows listed in the "Type of Analysis" column in Attachments A and B, with a description of this addition in a new Footnote 4 for Attachment A and a new Footnote 5 for Attachment B. The TCEQ has the following revisions in underlined and highlighted font below:

> Other approved analytical methods may be used to analyze for strontium-90, radium-226, radium-228, and lead-210. Lead-210 and strontium-90 may be determined using Gas Flow Proportional Counting (GFPC). Iodine-129 may be determined using low-energy gamma spectroscopy (LEGS). Radium-226 may be determined in all media using radon emanation techniques. Radium-226 may be determined using gamma spectroscopy when there is sufficient sample volume to yield minimum detectable activities (MDAs) consistent with the data quality objectives established in accordance with License Condition 165.A. Radium-228 may be determined by GFPC for all media. Radium-228 may be determined using gamma spectroscopy when there is sufficient sample volume to yield MDAs consistent with the data quality objectives established in accordance with License Condition 165.A.

Please note that any cited methods must already be approved by another state or federal agency to consider those methods as "other approved methods". Additionally, as indicated in other TCEQ correspondence, the Quality Assurance Project Plan (QAPP) must meet the Multi-Agency Radiological Laboratory Analytical Protocols Manual (MARLAP) standards containing the data quality objectives, method quality objectives, and method uncertainty for each radionuclide, for media and method, before any changes to the methods in Attachment A or B of the License could be considered.

2. The amendment application has proposed the following changes to Attachment A of the License in italic font. As provided below, the TCEQ has changes to proposed language as indicated by strike-through of proposed language and highlighted new language:

> **a)** One (1) upgradient well at north fence line (~~well cluster~~ *FWF-21*A, B, C, and D) and one down-gradient well at south fence line (~~well *cluster*~~ *FWF-10*A, B, C, and D).
> **b)** For *"PM-01/PM-02/PM-03* -East of Facility," WCS needs to spell out which zone these are to be consistent with the rest of their nomenclature: PM-01 (OAG) / PM-02 (125-zone) / PM-3 (225 zone).

c) In the "Sample" column, "The monitor well clusters *and Ogallala-Antlers* ~~Gatuna~~ Gatuña *(OAG) wells* (chemical), ~~*Ogallala-Antlers-Gatuna* (~~OAG~~)~~ *wells*, 225-foot zone top, 225-tone bottom, ~~*125-foot zone top*~~, 125-foot zone bottom.

The TCEQ has no additional comments with the proposed OAG wells specified and above proposed addition of a new Footnote 6; however, this information also belongs in a QAPP and must be amended to include this information.

Attachment A of the License is for background sampling. Thus, the TCEQ revises the "Type of Analyses" column to "Required Analytes" and add the following list of ~~radio analytes~~ radionuclides of concern: actinium-228, alpha (gross), americium-241, antimony-124, antimony-125, barium-133, barium-140, beta (gross), beryllium-7, bismuth-212, bismuth-214, carbon-14, cerium-141, cerium-144, cesium-134, cesium-136, cesium-137, chromium-51, cobalt-56, cobalt-57, cobalt-58, cobalt-60, curium-242, curium-243, europium-152, europium-154, europium-155, ~~gamma (ambient)~~, hydrogen-3, iodine-129, iridium-192, iron-59, krypton-85, lead-210, lead-212, lead-214, manganese-54, mercury-203, neodymium-147, neptunium-237, neptunium-239, nickel-59, nickel-63, niobium-94, niobium-95, plutonium-238, plutonium-239, plutonium-242, potassium-40, promethium-144, promethium-146, radium-226, radium-228, radon-222, ruthenium-106, silver-110m, sodium-22, strontium-90, technetium-99, thallium-208, thorium-228, thorium-230, thorium-232, thorium-234, uranium-233, uranium-234, uranium-235, uranium-236, uranium-238, yttrium-88, zinc-65, and zirconium-95.

For the "Media of Concern: Air particulates (all of the above), air gases (radon-222 only), soil/sediment (all of the above), vegetation/flora (all of the above), fauna (all of the above), ambient radiation (gamma only), groundwater (125-foot zone, 225-foot zone, and OAG) (all of the above), and surface water (all of the above).

3. The amendment application has proposed various changes to Attachment A of the License including the following: delete "Liquid scintillation for" and add Footnotes 3 and 4 to carbon-14; add Footnote 5 to iodine-129; add Footnote 2 to krypton-85 under the "Type of Analysis" for row titled "Air-Other vapor, gases"; add krypton-85 and delete lead-210 in Footnote 2; delete nickel-59, strontium-90, iodine-129, and radium-228 (actinium-228) in Footnote 3; and to make additional deletions to Footnote 4. Please provide information and justification for the proposed changes.

4. The amendment application has proposed changes to Attachment B to the License to add a new Footnote 11 and reference it in several places under "Frequency" column dealing with groundwater. The TCEQ agrees with the proposed change; however, this information also belongs in a QAPP and must be amended to include. This change should not take the place of a QAPP.

5. The amendment application has proposed changes to Attachment B of the License, for the row titled "Vegetation (chemical)," under "Type of Analysis" column in the form of strike-out for deletions and italics for additions as follows: "~~Gross alpha, Gross Beta, Alpha isotopic[1], Gamma spectroscopy[2], Liquid scintillation[3]~~ *Chemical analysis as per HW-50358 application Attachment VI, Appendix 6.6-2 Table 1, Revision 6, January 20, 2005."*

The TCEQ proposes that Attachment VI, Appendix 6.6-2 Table 1 be attached to the License as a new table. This table provides required chemical sampling for all matrixes in Attachment A and B of the License and it should also be provided in the QAPP.

6. The amendment application proposes to change Attachment B of the License under "Station/Location Reference" and "Frequency" fields for the "Sample – Septic, process water." The TCEQ does not agree

with the proposed changes in Attachment B, with the exception of the addition of "at a minimum" in "Frequency" field. Please provide an explanation and justification for the proposed changes.

7. The amendment application proposes to change Attachment B of the License, for radiological sampling at Perimeter Monitoring Well Clusters, as indicated in italics. As provided below, the TCEQ has changes to proposed language as indicated by strike-through of proposed language and highlighted new language:

In the "**Sample**" field:

Perimeter monitor well clusters[67] (designated A for OAG, B for 125-foot zone, C for 225-foot zone top, and D for 225-foot zone bottom), (radiological) Ogallala-Antlers ~~Gatuna~~ Gatuña (OAG) wells 225-foot zone top 225-foot zone bottom ~~125-foot zone top,~~ 125-foot zone bottom.

In the **"Station/Location Reference":**

FWF-1 (A, B, and C), FWF-2, FWF-3, FWF-4, FWF-5, FWF-6 (A, B, and C), FWF-7, FWF-8 *(A)*, FWF-9, FWF-10 (A, B, C, and D), FWF-11 , FWF-12, FWF-13, and FWF-14 (A, B, and C) – These stations shall be placed at approximately 150 feet intervals along southern perimeter of *the* FWF *landfill* from southwest corner to southeast corner. ~~at an approximate spacing of 150 feet~~
FWF-15 - Southern end of *the* FWF *landfill* east perimeter
FWF-16 (A, B, C, and D), FWF-17 (A, B, C, and D), and FWF-18 - Center portion of *the* FWF *landfill* eastern perimeter
FWF-*1*19, FWF-19 (B and C) - North~~we~~ast ~~*corner*~~ angled perimeter of the FWF *landfill*
FWF-20 - Eastern end of the northern ~~*the*~~ FWF *landfill* perimeter
FWF-21 (A, B, C, and D) and FWF-22 - North center of the FWF landfill perimeter
FWF-23 (A, B, C, and D) - Western portion of *the* FWF *landfill* northern perimeter
~~*FWF-24 Northwest corner FWF*~~
FWF-25 - *Northwest corner of the FWF landfill,*
FWF-26 (A, B, C, and D) , and FWF-27 (A, B, C, and D) - Center portion of *the* FWF *landfill* western perimeter
FWF-28 - Southern end of *the* FWF *landfill* west perimeter
CWF-1 (A, B, and C), CWF-2, CWF-3, CWF-4 (A, B, C, and D), CWF-5, CWF-6, and CWF-7 (A, B, C, and D) - Along southern perimeter of the CWF *landfill* from southwest corner to southeast corner at an approximate spacing of 150 feet
CWF-8 (A, B, C, and D) - *Northern end of the eastern perimeter corner of the CWF landfill* ~~*East center CWF perimeter*~~
~~*CWF-9 Northeast corner CWF*~~
CWF-*1*10 and CWF 10 (B, C, & D) - *Center of the n*~~*N*~~*North* ~~*center*~~ angled perimeter *of the* CWF *landfill* ~~*perimeter*~~
CWF-11(A, B, C, & D) - Northwest corner *of the* CWF *landfill*
CW-12 (A, B, C, & D) - West center *of the* CWF *landfill* perimeter
CWF-13 - Southern end of the CWF landfill western perimeter
All Resource Conservation and Recovery Act (RCRA) monitor wells

In the **"Frequency" field:**

~~*OAG and 125-foot wells*~~ Quarterly gauging and sample collection of all monitoring wells when water quantity is sufficient for sampling [11]
~~*225-foot wells Quarterly (when quantity sufficient for analysis is present)*~~

The TCEQ agrees with the proposed changes; however, to be consistent in nomenclature, the TCEQ proposes that the A, B, C, and D designations be used for the FWF and CWF wells that have been

installed to date in accordance with newly numbered Footnote 7 (old Footnote 6). The wells that will be installed later should also be added to the list in the same way.

8. The amendment application proposes to change Attachment B of the License, for the headings "Sample - Ogallala-Antlers-Gatuña (OAG) monitor wells" and the associated "Station/Location Reference" as indicated in italics. As provided below, the TCEQ has changes to proposed language as indicated by strike-through of proposed language and highlighted new language:

In **"Sample"** field:

Ogallala-Antlers-~~Gatuna~~ Gatuña (OAG) monitoring wells[78]
(radiological)
~~*Top and bottom of zone*~~

In **"Station/Location Reference"** field:

OAG-1, OAG-2, OAG-3 and OAG-4 - Center portion of the FWF landfill eastern perimeter
OAG-5 - Northern end of the FWF landfill east perimeter
OAG-6, OAG-7 and OAG-8 - Eastern end of northern the FWF landfill perimeter
OAG-9, OAG 10, and OAG-11 - North center zone the FWF landfill perimeter
OAG-12, OAG 13, and OAG-14 - Western end of northern the FWF landfill perimeter
OAG-15 - Northern end of the FWF landfill west perimeter
OAG-16, OAG-17, and OAG-18 - Center portion of the FWF landfill western perimeter
OAG-19 - Southern end of the FWF landfill west perimeter
OAG-20 and OAG-21 - Southern end of the CWF landfill east perimeter
OAG-22 and OAG-23 - Northern end of the CWF landfill east perimeter
OAG-24 and OAG-25 - Eastern end of the CWF landfill north perimeter
OAG-26 and OAG-27 - Western end of the CWF landfill north perimeter
OAG-30 - ~~Southern end~~ Northeast corner of the CWF landfill ~~west perimeter~~
GW-1- Stock pond
GW-2/*TP-31* - Baker Spring
GW-3/*PZ-68* - Playa west of by-product material facility
GW-4/*TP-14* - Playa north of the FWF landfill
GW-5 - Playa northeast of the CWF landfill
GW-6/*TP-117* - Playa east of the CWF landfill
~~*All RCRA wells*~~

9. The amendment application proposes to change Attachment B of the License as indicated in italics. As provided below, the TCEQ has changes to proposed language as indicated by strike-through of proposed language and highlighted new language:

In the **"Sample"** field:

Combined facilities background monitor wells
~~*Top and bottom of zone*~~

In the **"Station/Location Reference"** field:

A-16 - OAG well located southeast of CWF[e]
PM-01 - OAG well located in northeast portion of RCRA permit area[89]
PM-07- OAG well located in eastern portion of RCRA permit area, northwest of old ranch house[89]
TP-14 - OAG well located northeast of FWF[89]
TP-18 - OAG well located just outside the northeast corner of FWF[89]
TP-19 - OAG well located north of the CWF[89]
TP-20 - OAG well just north of RCRA permit area, between stations 7 and 16[89]

TP-31 - OAG well located at Baker Spring[89]
TP-46 - OAG well located south of the FWF[89]
A-22 - Well in the 225-foot zone located southeast of the CWF and A-16[89]
A-24 - Well in the 225-foot zone located southeast of the CWF and west of A-22[89]
MW3A - Well in the 225-foot zone located north of the by-product material facility[89]
11 B - Well in the 225-foot zone located south of the by-product material facility[89]
5E-A - Well in the 225-foot zone located south of the FWF[89]
DW35A - Well in the 225-foot zone located south of the RCRA landfill[89]
PM-03 - Well in the 225-foot zone located in northeast portion of RCRA permit area[89]
PM-06 - Well in the 225-foot zone located northeast of CWF[89]
TP-69 – Well in the 225-foot zone located north of the CWF and FWF[9]

10. The amendment application proposes to change Attachment B of the License to delete analysis. In Attachment B of the License, the following "Sample and Station/Location references" are repeated: "Perimeter monitor well clusters," "Ogallala-Antlers-Gatuña (OAG) monitoring wells," and "Combined facilities background wells." The analyses listed for these second set of required samples, however, are for chemical analysis instead of radiological analyses. The amendment application proposes the same changes and the TCEQ makes the same comments as above for the categories of Attachment B, "Sample and Station/Location References."

11. The amendment application proposes to change Attachment B of the License as indicated in italics font to Footnote Nos. 1, 6, 7, 8, 9, and 10. As provided below, the TCEQ has changes to proposed language as indicated by strike-through of proposed language and highlighted new language:

1. Alpha isotopic analyses during the pre-operational monitoring period must include, but not be limited to, ~~*radium-226*~~, americium-241, neptunium-237, plutonium-238, plutonium-239, plutonium-242, curium-242, and curium-243; and thorium and uranium radionuclides (such as thorium-232, uranium-234, uranium-235, uranium-238). Alpha isotopic analyses during the construction and operational period are performed only if confirmed gross alpha (initial result and re-analysis) exceeds investigation limit (IL) and will include the same radionuclides.

~~5.~~*6.*Ephemeral playa locations will be recorded using Global Positioning System (GPS) coordinates. Sampling locations are dependent on weather conditions and may vary from monitoring event to monitoring event.

~~6.~~*7.*Perimeter monitoring well clusters will be installed as the disposal units are developed. Initial construction of perimeter monitoring well clusters for pre-operational monitoring will consist of the following well clusters: FWF-1, FWF-6, FWF-10, FWF-14, FWF-16, FWF-17, FWF-19, FWF-21, FWF-23, FWF-24, FWF-26, FWF-27, CWF-1, CWF-4, CWF-7, CWF-8, CWF-9, CWF-10, CWF-11, and CWF-12. Well clusters to be installed prior to waste receipt consist of: FWF-2, FWF-3, FWF-4, FWF-5, FWF-9, FWF-11, FWF-12, FWF-13, FWF-15, FWF-18, FWF-20, FWF-22, FWF-28, CWF-2, CWF-3, CWF-5, CWF-6, and CWF-13.

~~7.~~*8.*The perimeter OAG wells (those that are not part of a well cluster) will be installed prior to waste receipt.

~~8.~~*9.*Sampling and analysis procedures to be submitted for review by the executive director. This information must be included in the Site-specific Data Assessment and Management Plan (S-DAMP) and the Quality Assurance Project Plan (QAPP). The site QAPP must follow the Multi-Agency Radiological Laboratory Analytical Protocols Manual (MARLAP) process, and which

will include detail of the data quality objectives (DQO), the method quality objectives (MQO), and the "Method of Uncertainty" for each radio-analyte per media and for each method.

~~9.~~*10.* These wells will be monitored under this license for the duration of their lifetime. As the RCRA landfill is advanced, these wells will require decommissioning and possible replacement, as they are within the area that will be disturbed by RCRA landfill construction.

12. TCEQ's consultant, Jeffrey Paine, Ph.D., recently conducted an electromagnetic verification study of the site. The verification study indicates that a playa southeast of the CWF is a recharging playa that is located in the Draw and directly downstream from the planned FWF and CWF disposal units. The TCEQ is proposing the following be added to the REMP in response to the amendment application: 1) that surface water samples and soil/sediment samples be collected and GW-6 be sampled in this playa for quarterly monitoring; and 2) that these samples be added to Attachment A and B of the License for analyzed for gross alpha, gross beta, alpha isotopic, liquid scintillation, (and possibly for "other approved methods" if WCS provides further explanation in response to this NOD.)

III. Specific Deficiencies regarding Appendix 2 of the Minor Amendment Application (Engineering Report Pertaining to the Installation of the Rail Loop)

Please note that this amendment application does not address the use of the rail loop for the transportation and acceptance of low-level radioactive waste or mixed low-level radioactive waste for disposal. License condition 95 that prohibits the acceptance of waste for disposal by rail is not under consideration as part of the license amendment process

1. Several of the parameters in the hydrologic/hydraulic report on the rail loop submitted with the amendment application did not include supporting data showing compliance with LC 84. Please provide the following items: (1) Supporting data on the SCS Lag Times for each sub-basin and on the Lag Time routing for each Reach; (2) the meteorological model and the parameters for this model used in HEC-HMS; and (3) electronic files used in the HEC-HMS and HEC-RAS model runs.

2. The appendix of the hydrologic/hydraulic report on the rail loop indicates that a curve number of 60 was used in the HEC-HMS model run. However, previous hydrologic models submitted by WCS that were reviewed and accepted by TCEQ depict a curve number in the range of 75 to 80. Please explain the impact of this difference or revise the model to maintain consistency with site model runs.

3. The hydrologic/hydraulic model presented in the report does not contain details or analysis of the culverts used for the rail spur/loop. Please provide the culvert design used for the rail spur/loop. This design must include an analysis of the hydraulic computations involved and the resulting headwater, tailwater, and velocities. Additionally, please provide structural details and analysis of the culvert under the loading conditions expected for this rail spur/loop to analysis their performance and potential impact on the model.

4. The hydrologic/hydraulic report does not provide details of design or grading for the rail spur. Also, from the submission, it is not clear if erosion protection was implemented in the design of the rail spur. Please provide details on the channel design used adjacent to the rail spur and the grading of the rail spur. Also, please provide erosion protection along the sides of the rail spur and along the bottom of the channels adjacent to the rail spur.

IV. Discussions Regarding the FWF Proposed Re-design in Relation to Protection of Water

After review of the studies by both WCS and Dr. Paine, the TCEQ has concerns that relate to water protection and management, which are addressed in relation to the requirements of various license conditions. Borrowing from the experience of the By-Product Disposal site excavation and construction, the TCEQ is aware that WCS had to implement dewatering procedures to manage flow of groundwater from surficial OAG materials into the facility excavation. Therefore, the TCEQ presumes that water management plan would be prudent for both the Compact and FWF facility prior to the start of excavation and construction. The TCEQ expects the Licensee to address the following preliminary matters relating to environmental monitoring and reconfigurarion/redesign of both the CWF and the FWF as follows:

1. Regarding LC 53.A: LC 53.A requires that the Licensee submit modeling to "Demonstrate that the buffer zones established for the land disposal facility will be unsaturated at all times. The representative present and future climatic parameters in the license application must be incorporated into the modeling". Additionally, the "studies" and "analyses" referenced in LC 52.B include the geostatistical study of the top of the Dockum materials resulting from WCS responding to LC 52.A. LC 53.A basically requires that WCS re-establish the locus of the OAG "dry line" relative to the one previously presented. Thus, these LC 52.A and B form the basis of any evaluation of the sufficiency of the reconfigured facility and WCS' response to these conditions would likely play a prominent role in TCEQ's evaluation of the water management plan submitted to the TCEQ.

On August 11, 2009, WCS submitted a report to the TCEQ entitled "Groundwater Model of the OAG for the Waste Control Specialists Site, Andrews County, Texas." Although this report addresses the OAG water table, it is noted that this report does not address the requirement of LC 53B regarding the Dockum Group water table. Please revisit the subject of maximum elevation of saturated conditions in the Dockum via modeling, sensitivity studies, and uncertainty analyses after verification studies are complete and upon further consultation with the TCEQ.

Review of submitted groundwater modeling to date indicates that the modeling utilized a very restrictive set of constraints on domain boundaries and unjustified parameter distributions. There is also no sensitivity analysis or geostatistical study accompanying the model as required. Please refer to a more detailed description of the TCEQ's comments regarding the OAG modeling study in the TCEQ correspondence to WCS dated March 16, 2010. Given these concerns, WCS' modeling of the current and future locus of the OAG "dry line" can not be relied upon to serve as a basis for assessing the sufficiency of the reconfigured disposal units as presented in Appendix 3. Please provide a comprehensive hydrological conceptual model of the site that incorporates and considered concerns already expressed and the discussion above.

2. Regarding LC 53.B. Discussion at the March 29, 2010 at TCEQ, WCS indicated its intent to drill a series of as many as five new boreholes to a depth of 30 meters along the red-bed ridge. Please see Figure 1 below for a map of these locations - In descending priority order, these include (a) three boreholes along EM line 4 in the FWF and CWF footprints (L4A, L4B, and L4C), (b) one borehole along EM line 4 in the small playa east of the CWF (L4D), and (c) one borehole near the intersection of EM lines 2 and 8 in the middle part of the FWF (L2A). Unless samples and cores are available from acceptable nearby boreholes, each of these boreholes should be sampled within the OAG section and cored within the Triassic section.

TCEQ and/or its contractor intents to log boreholes along the red-bed ridge (as well as suitable nearby monitoring wells) with natural gamma and electrical conductivity probes for comparison with lithologic descriptions, samples, and geophysical data. This work should be done as soon as possible in order to have additional information prior to excavation of the disposal units. If WCS proposes alternative wells or boreholes to be logged, such as utilizing monitoring wells already planned for the CWF and FWF, please submit those alternatives be reviewed and approved by TCEQ.

Location and Description of Proposed Boreholes: All locations are shown on the included map and are given in UTM coordinates, North American 1983 datum, zone 13 north, meters. All depths are 30 m. If samples and cores are available from suitable nearby wells, sampling and coring may not be necessary if that well is also available for geophysical logging. Proposed boreholes include:

L4A
Along line 4 about 150 meters southeast of intersection of lines 1 and 4; southeast corner of FWF site adjacent to eastern wall of CDU
Location: x = 682936 m, y = 3590935 m
Sample OAG, core Triassic strata Conductivity and gamma logging
Within footprint of CDU excavation in Federal Waste Facility

L4B
Along line 4 about 11 meters southeast of intersection of lines 4 and 7; southeast corner of CWF adjacent to eastern wall of CWF Sediment Retention Pond
Location: x = 683243 m, y = 3590806 m
Sample OAG, core Triassic strata
Conductivity and gamma logging
Within footprint of CWF near sediment retention pond

L4C
Along line 4 about 65 m northwest of intersection of lines 1 and 4; southern part of FWF adjacent to western wall of CDU excavation
Location: x = 682745 m, y = 3591030 m
Sample OAG, core Triassic strata
Conductivity and gamma logging

L4D
Along line 4 near eastern end of line; near center of playa east of CWF
Location: x = 683450 m, y = 3590725 m
Sample OAG, core Triassic strata

L2A
Along line 2 east of intersection with line 8; within FWF
Location: x = 682745 m, y = 3591295 m
Sample OAG, core Triassic strata
Conductivity and gamma logging

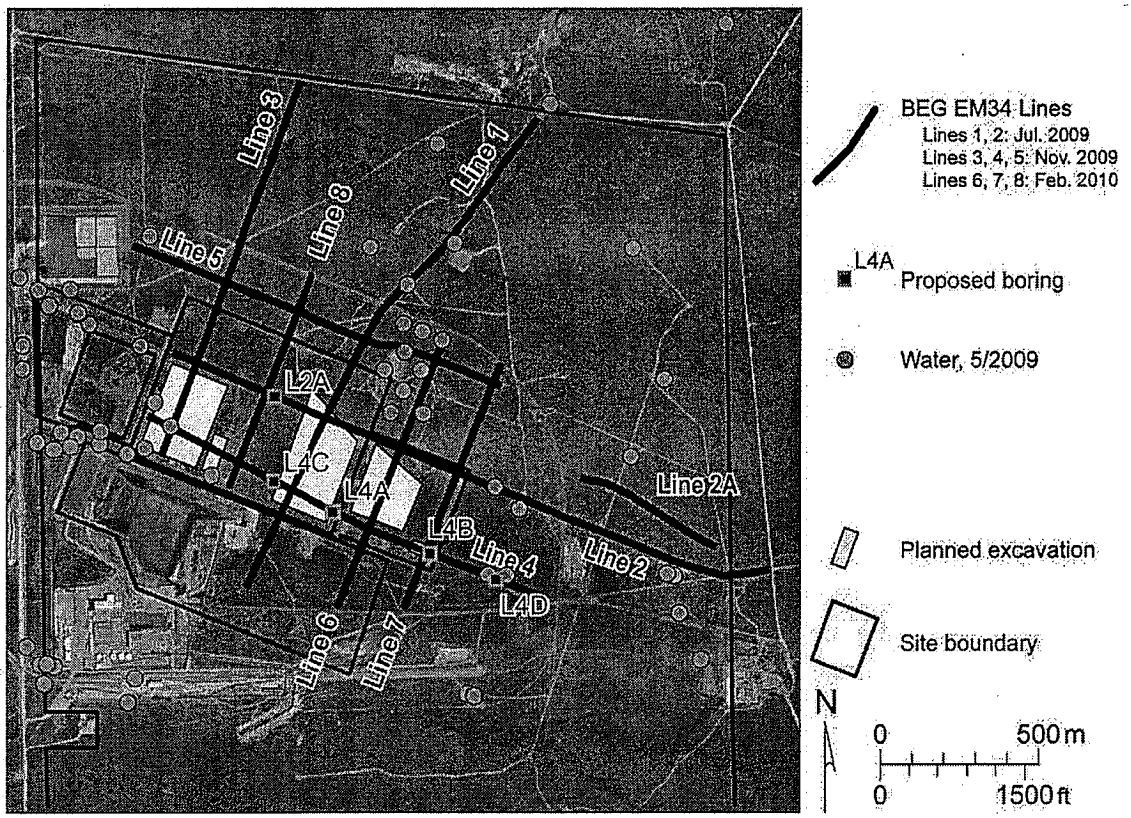

Figure 1. Map showing BEG geophysical lines 1 through 8, planned excavations within the FWF and CWF, wells with OAG water in May 2009, and proposed boring locations.

V. Specific Deficiencies regarding Appendix 3 of the Amendment Application. (Basis for LC 64 Modifications to Facility Design)

1. Regarding Facility Reconfiguration: WCS' hydrogeologic, geostatistical and numerical modeling studies, which indicate that saturated conditions in the OAG materials at the proposed site, are more extensive than those described in the prior license application and supplemental revisions. Appendix 3 of the amendment application states that the proposed reconfiguration not only meets the necessary requirements of LC 64, but in fact *exceeds* those requirements. Arguments for the sufficiency of the proposed reconfiguration are presented in documents previously submitted to the TCEQ in response to LC 52 A, LC 53A and LC 53 B. WCS states that that the reconfigured FWF in Appendix 3, will remain outside the most extreme possible extent of both the OAG "dry line", and saturated conditions in the Dockum materials, over the entire period of analysis. The reconfiguration proposed in Appendix 3 involves alterations in the design of *both* the FWF and CWF disposal units, as the completed hydrogeologic, geostatistical, and modeling studies indicated that both the current and future OAG "dry lines" are likely to have a spatial extension significantly beyond the "dry line" presented in the application. For the reconfiguration described in Appendix 3 some points on the original footprint of the FWF disposal cell have been moved hundreds of feet rather than the 50 feet specified by the license.

The TCEQ review indicates that the reconfiguration does satisfy the requirement of LC 64 that "the base of the disposal units within the FWF must have a final elevation of no lower than 3,370 feet mean sea level. The base of the disposal unit is the lowest point at which waste will be disposed." However, the reconfiguration described in Appendix 3 (see Exhibit 1, Pages 5 and 6) depicts a northernmost edge, as

defined by the FWF fence line (coincident with the edge of the buffer zone along that segment) , as unaffected by the reconfiguration. Thus, along a segment of the northernmost edge of the FWF neither than fence line, nor the buffer zone have been reconfigured relative to the fence line, or buffer zone, presented in the license application.

Please revise drawings to clarify that the reconfiguration presented in Appendix 3 satisfies the requirement that "the northernmost edge of the Federal Facility Waste Disposal Facility will be relocated to be at least 50 feet further from the Ogallala-Antlers-Gatuña (OAG) "dry line" presented in the application". The rules 30 TAC §336.2 (50) defines "Federal Facility Waste Disposal Facility" as "a low-level radioactive waste land disposal facility for the disposal of federal facility waste licensed under Subchapters H and J of this chapter". In addition, 30 TAC §336.2 (68) defines "Land Disposal Facility as "the land, buildings and structures, and equipment which are intended to be used for the disposal of low-level radioactive wastes into the subsurface of the land". The expected application of these definitions to the reference in LC 64 to "the northernmost edge of the Federal Facility Waste Disposal Facility" implies that the license condition is referring to the locus of a perimeter enclosing all federal facility elements, including the buffer zone, the proposed disposal cells, the roadways, the storage tanks, and all staging areas and operational buildings. Furthermore, it appears that the FWF fence line, indicated on Exhibit 1, Pages 5 and 6 of Appendix 3, is coincident with such a locus.

2. Table 1 labeled "Distances Revised Design Moves Away from OAG Dry Line" of the amendment application depicts the coordinates (in terms of northing and easting) and distances "moved away from OAG dry line" of various corners of the original and reconfigured designs. Neither of the plan views in Exhibit 1 showing the original and reconfigured facility footprints show the locus of the OAG "dry line" or give an indication as to how the "distance moved away from the OAG dry line" given in Table 1 was determined. Please revise Table 1 to indicate the distances of these corners from the OAG "dry line" prior to the reconfiguration.

3. From the information provided in Appendix 3, the northernmost edges of the planned disposal units within the FWF are at least 50 feet further from the OAG "dry line," and, in some locations, points on these edges have been moved considerably further than 50 feet. The concern with simply moving each point on the northernmost edge so that it is at least 50 feet further from the point on the "dry line" to which it is paired (the closest point) is that this does not necessarily guarantee that the moved point is then 50 feet further from *all* points on that "dry line." For the facility design submitted, each point on the northernmost edge of the FWF could be paired with the corresponding point on the OAG "dry line" to which it is closest. The determination of the complete set of such pairs is dependent on loci of both the northernmost edge and on the OAG "dry line."

Please revise Appendix 3 to demonstrate how each point on the northernmost edge was reconfigured with reference to the OAG "dry line." Please clarify the procedures and methodology used to determine the distance of the reconfigured facility from the OAG "dry line." Specifically, Exhibit 1, pages 5 and 6 should be revised to show the OAG "dry line" and distances from that locus of significant points on the "northernmost edge", both before and after reconfiguration.

4. In Appendix 3, WCS reconfigures the FWF and CWF relative to a reconfigured OAG "dry line", which differs from the "dry line" of reference in the application. Because the porous media constituting the OAG overlay and the relatively non-conductive materials of the Dockum formation, the location and flow of water in the OAG materials and the locus of the OAG "dry line" is sensitive to the elevation of the top of the Dockum materials. Thus, any modeling attempting to accurately locate the current and future locus of that "dry line" is dependent upon the available spatial resolution of the top of the Dockum materials. Consequently, LC 52.A requires that the Licensee "verify the elevations of the top of Dockum Group within the site area with sufficient spatial resolution to support any modeling relying upon these

elevations". The referenced modeling included computational modeling of the current and future locus of the OAG "dry line".

The May 14, 2009 report, "Geostatistical Analysis of the Top of the Dockum Red Beds at the Waste Control Specialists Site, Andrews County, Texas", addresses the requirements for a geostatistical study of the elevation of the top of the Dockum materials. The elevations of the top of the Dockum materials were not shown with sufficient spatial resolution in this report to adequately support modeling relying upon these elevations. Please demonstrate that the elevations of the top of the Dockum have sufficient spatial resolution to adequately support the groundwater modeling required in LC 53.A and LC 53.B.

VI. Specific Deficiencies regarding Appendix 4 of the Amendment Application. (Bases for Requested License Revisions Related to the Environmental Monitoring Program)

1. Regarding LC 165A: The amendment application proposes to change LC 165A of the License as indicated in italics below. However, a Data Quality Objective Document or Quality Assurance Plan has not been submitted. This information must be submitted for review of the TCEQ. As provided below, the TCEQ has changes to proposed language as indicated by strike-through of proposed language and highlighted new language:

> 165A General Provisions. The Licensee must conduct the radiological and non-radiological environmental monitoring specified in this license. The Data Quality Objective (DQO) Process, established by the United States Environmental Protection Agency (US EPA), must be used to establish performance or acceptance criteria, which serve as the basis for designing any of the monitoring plans for the facility for collecting data of sufficient quality and quantity to support the goals of each plan (pre-operational, operational, and post-operational). The Licensee must use the DQO Process, which consists of seven (7) iterative steps in development of a data collection design that specifies the type, number, location, and physical quantity of samples and data, as well as the quality assurance and quality control activities that will ensure that sampling design and measurement errors are managed sufficiently to meet the performance or acceptance criteria specified in the DQOs. ~~These outputs of the DQO Process must be used to develop a Quality Assurance Project Plan and for performing Data Quality Assessment for the pre-operational, operational, and post-operation phases that have not been completed to date. The DQO document and Quality Assurance Project Plan must be submitted to the executive director for review within six (6) months of the next major sampling event performed at the site.~~ WCS must submit a Quality Assurance Plan (QAPP) that follows the Multi-Agency Radiological Laboratory Analytical Protocols Manual (MARLAP) process, and which will include detail of the data quality objectives (DQO), the method quality objectives (MQO), and the "Method of Uncertainty" for each radio-analyte per media and for each method. The QAPP must be submitted to the executive director for review prior to any sampling is performed for the Modified Natural Radiation Monitoring Program and the Pre-Operation, Construction, and Operational Environmental Monitoring Program for this license.

In addition to the amendment application proposed of numbering of footnotes No. 4 under Attachment A of the License to Footnote No. 5, and Footnote No. 8 under Attachment B, to 9, the TCEQ also proposes the following change to these two notes:

> Sampling and analysis procedures to be submitted for review by the executive director. This information must be included in the Site-specific Data Assessment and Management Plan (S-DAMP) and the Quality Assurance Project Plan (QAPP). The QAPP must follow the Multi-Agency Radiological Laboratory Analytical Protocols Manual (MARLAP) process, and which

will include details of the data quality objectives (DQO), the method quality objectives (MQO), and the "Method of Uncertainty" for each radio-analyte per media and for each method.

2. The amendment application proposes to change LC 165A of the License and further clarifications are therefore necessary. The TCEQ proposes changes to clarify what quality assurance/quality control samples will be necessary and which should be included with sample batches, and to include MARALP terminology to be consistent with LC 165.A. As provided below, the TCEQ has changes as indicated by strike-through of existing language and highlighted new language:

> Environmental samples shall be analyzed by a NELAC certified laboratory. Prior to analysis, WCS must provide a list of methods that are not NELAC certified that they plan to use and a list of methods that were NELAC certified but have been modified. This information must be included in the QAPP. As part of radiological sample analyses, all ~~runs~~ analytical batches ~~performed by a laboratory,~~ must include laboratory control blanks, method blanks, matrix spikes, and laboratory duplicates and only include WCS samples. An analytical batch must be defined in the QAPP. In addition, the laboratory must provide the laboratory measurement of certainty.

3. For further clarification, the TCEQ has changes to proposed language as indicated by strike-through of existing language and highlighted new language for LC 165.D:

> ~~Duplicate~~ Split Samples. The Licensee must provide the executive director an opportunity to obtain ~~duplicate~~ split samples concurrently with the Licensee's data collection schedule.

VII. Specific Deficiencies regarding Appendix 5 of the Amendment Application. (Basis for Additional Modifications to WCS Facility Design)

1. The minor amendment application states that the depth of the base of the CWF will be increased by seven feet, resulting in a five percent (5%) decrease in radionuclide travel time to the 225-foot zone from 15,000 years by roughly 800 years with no change in total dose of 0.58 millirem per year for chlorine-36. Thus, no impacts to human health and the environment are anticipated.

No information or discussion was provided on how reconfiguration of the CWF would affect total unit volume (i.e., reduction in volume of backfill), total Curie amounts, and/or concentrations in the source term resulting in changes to the performance assessment. In addition, the minor amendment application does not include a similar discussion for the FWF.

Please provide information or a discussion on the affects from reconfiguration of both the CWF and FWF, including but not limited to, changes in volumes or concentrations in the source term and any impacts this might have on the performance assessment. If this will be addressed in the Performance Assessment Maintenance Plan, please state so.

2. The reconfiguration of both the CWF and FWF may result in changes to the cost estimates and/or financial assurance submitted in the license application. The TCEQ review of the appendices 3 and 5 indicated that they contained no cost estimates reflecting the described changes in the application. Please submit updated cost estimates to ensure consistency with the construction drawings.

3. Updating the costs estimates and reconfiguring the CWF and FWF may result in changes to the Site Closure and Decommissioning Plan. Please submit an updated Site Closure and Decommissioning Plan as required by LC 187A.

4. The Minor Amendment Application indicates that the small playa east of the CWF will be removed during construction. LC 85 requires plans to mitigate the impact from the remaining portion of the small playa. The amendment application proposes to fill in the playa; however, there is no narrative or analysis that quantifies the effectiveness of this proposal. TCEQ recommends selection of one of two approaches in calculating the effects on the CWF. The first approach has three components as follows:

a) An analysis of the extent of recharge areas is required for the playa for conditions prior to and after filling in the playa;
b) A completed topographic map should be included under existing and modified conditions to quantify surface water impacts before and after the proposed modifications; and
c) The infiltration rates for before and after the filling of the playa should be compared.

The second approach is to correlate the surface water effects with the water level data from the OAG formation to determine its impact on water infiltration in the playa, and then compare these results with water level data from the OAG formation taken after the proposed filling of the playa. Evaluations of the surface water and its impacts on the OAG can then inform ways of minimizing this infiltration if further mitigation is required.

In summary, please demonstrate that the filling in the playa will mitigate the impact from infiltration into the playa or provide another means of mitigating the impact using one of the approaches above.

5. In a WCS submittal dated April 3, 2009, a work plan regarding the re-design of the ledge ditches on all sides of the disposal unit was presented. In the submittal, the design of the ledge was based on a trapezoidal channel. However, the construction drawings in the minor amendment application referencing LC 63 indicate triangular channels. Please confirm the design for the ledge ditches of the disposal units.

One of the major features in construction drawings under consideration that differs from the license application construction drawings is the inclusion of the sedimentation ponds within the disposal footprint. Please submit an engineering report, including a narrative and analysis, for site-wide water management to address proposed stormwater and other water conveyances presented in the minor amendment application and located on the facilities.

Please provide for sampling and analysis in the REMP and the engineering report requested above. Please provide a sampling and analysis plan for the water within the retention pond. This plan should include DQO's with sampling frequencies, analytic methods used, etc.

In the revision drawings, it is not clear why the retention / sedimentation ponds are located within the disposal unit footprints. It appears that the ponds would have to be relocated sometime during the operational life of the facility. Furthermore, retaining stormwater within the disposal unit footprint might contribute to saturated conditions within the footprint. Please remove the sedimentation ponds to a location outside the disposal footprint that will not negatively impact potential infiltration or re-infiltration of collected water.

In the first attachment of the workplan dated June 23, 2009, the total volume of stormwater falling within the footprint of each of the proposed facilities, but outside of the excavated footprint of the disposal units themselves, is determined after estimating the areas of those footprints and subtracting them from the total area of each respective facility. This "net" area is then multiplied by an estimated depth of rainfall due to the 100-year 24-hour storm (six inches) to determine the total volume of stormwater within each facility boundary requiring conveyance to a retention pond.

It is unclear from the submitted document upon what basis the estimated areas of the excavated footprints were determined. Because the possible volume of stormwater requiring conveyance to retention ponds may have been underestimated it is possible that the engineering designs included in the WCS response to LC 63 have resulted in undersized retention ponds. Please resize sedimentation ponds to retain the maximum volume of stormwataer needed over the operational life of the facility.

In a workplan dated June 23, 2009, WCS states that sedimentation ponds, are an integral aspect of the calculations supporting the construction drawing and the minor amendment application. The possible undersizing of the volume of the retention ponds may be exacerbated by a failure to design the ponds to include erosional sediment due to the 100-year storm event itself, rather than just the volume of sediment expected from averaging erosional processes over an extended period of time (e.g., the period of analysis). Please resize the sedimentation ponds to account for the possible erosion from a 100-yr storm event.

In the first attachment of the workplan dated June 23, 2009, each of the areas comprising the total area of a facility outside of the excavated units are weighted by a "curve number", CN, so that a composite CN can be determined for each facility. During this determination each of the impervious areas in the total area are correctly assigned a CN value of 98. However, in the assignment of a CN value to the largest of the sub areas, the so-called "open area" within each facility WCS has assumed that the AMC (Antecedent Moisture Condition) for such areas should be modified for the presence of a Condition I (i.e., Dry Soils, prior to or after plowing or cultivation, or after periods without rain), rather than be assigned a CN corresponding to an AMC Condition II soil (i.e., Typical conditions existing before maximum annual flood).

This assumption results in the reduction of the CN value for the open areas from 86 to 72 and a resultant reduction in the composite CN from approximately 88 to 75. This reduction, in turn, results in a reduction of the total amount of stormwater requiring conveyance, for the CWF for example, from approximately 350,000 ft^3 to 250,000 ft^3 (see calculations on page 5/11). Based on the same assumption regarding the ARC soil condition, a similar reduction occurs in the estimated stormwater for the FWF (see page 3/11).

In the absence of any justification to the contrary, if is assumed that the appropriate, conservative value of CN for the open areas is 86, rather than the value of 72 utilized in the first attachment, then it is possible that retention ponds designed on the basis of the lower value are undersized. Please address this discrepancy

6. In the second attachment of the workplan, a systematic approach with which to manage stormwater within the footprint (but outside the disposal units) was not clearly presented. WCS used the TR-55 method in sizing the sedimentation pond in Attachment 1, and used the Rational Method in sizing the ditches in Attachment 2. It is not clear why two different design methods were chosen to determine the flow rates of runoff flowing into the pond and the ditches. While the design method in the first attachment estimates a total volume of stormwater the design method in the second attachment estimates only a maximum discharge (a volumetric rate) for which each ditch must be designed to carry. While it appears that ditches designed on that basis will be able to carry the estimated total volume of stormwater, the attachment makes no comment relative to the problem. Neither is it clear from this attachment whether or not the ditches will be lined or will simply be allowed to erode over their operational lifetimes.

Both systems are connected (water flows from the ditches to the pond). Ideally, flow from the ditches can be routed through the pond, retained there over a 24-hour period, and sampled. If the samples appear uncontaminated, the stormwater in the pond may be released in a controlled fashion to a reinforced outfall

per a stormwater management plan. Please include pond routing into a hydrologic model of this system to ensure a consistent design approach.

7. In the second attachment of the workplan, page 20 of Attachment 2 of the work plan depicts sub-basins draining to their respective ditches. However, this page is merely a hand drawing and it is unclear as to what certain lines indicate. Furthermore, it appears that certain sub-basins drain into the disposal units. If so, then the ditches on the ledges within the units are under designed. If not, then there do not appear to be ditches designated in Figure 1, which would intercept the flow from the units. Finally, the times of concentration listed for the design of ditches appears high. And, there is no indication of the paths associated with the estimates of these times of concentration to allow for verification of their values. Please address these concerns.

8. In the second attachment of the workplan several surface water design elements require further detail. Please provide hydraulic grade lines of the 24" reinforced concrete pipes and culverts. It appears that the triangular ditch design would be hard to maintain. TCEQ prefers the more ubiquitous trapezoidal ditch design. Also include rip-rap for reinforcement from erosion in the design of the ditches.

9. The work plan submitted does not appear to consider or discuss the encroachment of future phases of the disposal units onto the ponds. Please provide a discussion of this contingency.

10. The submitted work plan regarding LC 52.C required accounting for lateral drainage. The applicable model is the VS2Di program, which can account for saturation at the periphery of the model domain through boundary conditions.

Please re-submit this report using VS2Di to determine the effects of a saturated drainage layer on the infiltration rate. The revised report should address sensitivity of the parameters, combinations of scenarios, and appropriate boundary conditions. Additionally, a re-design of the cover to promote vegetative growth as required by LC 76 should be addressed. Additionally, a geostatistical model should be presented including the extent and elevation of saturated conditions of the OAG due to a future rise in water surface elevation pursuant to LC 52.C.

11. In the final construction drawings submitted on June 29, 2009 to demonstrate compliance with LC 63, there was no identification of changes through the use of a helpful cloud outline around the changes. Without these standard, customary engineering drawing revision notations and practices, the TCEQ cannot compare the final drawings to the earlier versions. Please submit revised construction drawings that identify changes using clouds around them and associated notes, and revision number listed around those clouds. It would also be helpful to provide narratives explaining the revisions as appropriate.

12. A detailed description of the changes made in the drawings was not provided. Additionally, explanation or justifications supporting those changes were not provided. Please provide descriptive explanations and justifications for the changes that were made on the drawings so that a proper technical review can be performed.

13. The TCEQ was unable to locate the Performance Requirements referenced as C1.24 through C1.32, and C2.28 through C2.36. Please provide the Performance Requirements referenced in drawings C1.24 through C1.32, and C2.28 through C.2.36.

14. It appears that on many occasions WCS replaced 2 or more old drawings with one new drawing; however, detailed explanations were not given to justify these changes. For example old drawing numbers C1.19 and C1.41 were replaced with new drawing LC1.17. Please provide detailed explanations and justification for making these changes.

15. The amendment application has not provided the reasons for considering that drawing C2.02 (FWF Typical Roadway Sections), C2.07 (FWF-NCDU Liner Profile Sections), and C2.13 (FWF-CDU Liner Profile Sections) is not needed now. Please provide the reasons for considering that drawing C2.02 (FWF Typical Roadway Sections), C2.07 (FWF-NCDU Liner Profile Sections), and C2.13 (FWF-CDU Liner Profile Sections) is not needed now.

16. The titles of the drawings LC0.23 through LC0.26 do not match with the titles listed in the Table 1 for these drawings. Please make the necessary correction mentioned in this comment and submit revised documents/drawings.

17. It was stated in item 3 on page 8 of 'Introduction' section of the submittal that "...the extent of detailed design information included in LA for the 500,000 gallon tanks has been reduced, and many drawings originally included have been removed, thereby allowing potential construction subcontractors to propose alternative compliant tank designs." Please submit all the drawings, specifications and other documentation received from the subcontractors and manufacturers to TCEQ for review and approval.

18. There have been ongoing discussions on the importance of locating all waste handling operations outside of the buffer zones to maintain compliance with LC 65. The FWF Intermodal Staging Building and FWF Vehicle Decon Building should be relocated to outside the buffer zone, and the proposed zig-zag layout of the buffer zone near this area should be straightened, so that all the buildings are located on the outside the buffer zone. This would help keep the traffic-flow through the buffer-zone to a minimum and help maintain its integrity. Please make the above mentioned changes to the buffer zone and submit revised documentation including the drawings (showing the changes surrounded by clouds, and associated note and revision marks).

19. The submitted construction drawings appear to indicate that the water flows from the elevated footprint of disposal area into storm-water/sedimentation retention ponds (which are shown to be inside the area bounded by buffer zone) through V shaped open ditches. Where as, the 24" concrete stormwater drains with man-holes which are located along the side of the paved road on the south side of the FWF and CWF disposal areas, appear to be mainly intended for the storm-water from the paved road drains through openings on the side of the road and flow through stormwater drain pipe into CWF sedimentation pond. However, WCS has not shown a similar stormwater drain piping system for the road on the left side of the facility going north-east to the buildings located on the north-east side.

Please move the stormwater/sedimentation retention ponds outside the disposal zone to a suitable area. Also, a paved road in the north-south direction on the left edge of FWF disposal area needs to be constructed for traffic going to the buildings located on the north side of the disposal area. Please update the associated drawings and submit them with changes clearly marked according to standard engineering drawing conventions.

20. The submitted construction drawings do not show where the internal tank overflows are located for the 500,000 gallon contact water tanks. They are not shown on LC0.18. Please submit revised drawings showing the tank overflows on the inside. Also provide the dimensions and details about it features, if any.

21. The submitted construction drawings do not show whether the 500,000 gallon contact water tanks are going to be designed to be consistent with final designs of similar tanks for by-product disposal facility at this site. It was also mentioned that vendor who will be building these tanks would be responsible for all the designs and specifications.

Please provide documentation to confirm that the design of the 500,000 gallon contact water tanks are consist with designs of the by-product processing and disposal landfill approved by TCEQ. Also, please provide all the final design details, specifications, and shop drawings developed by vendor to TCEQ for review and approval prior to the start of fabrication. Additionally, please provide detailed drawings of the appurtenances on these tanks.

22. The submitted construction drawings do not show details were provided on the vent on 500,000 gallon contact water tanks. WCS should ensure that the vent are covered with at least 16-mesh or finer. Provide revised drawing showing the details of the vent including mesh. Please provide revised tank drawings showing the details of the air-vent, including mesh size, as noted in the comment above.

23. In the schematic drawing LC0.25, the inlet-line on each of the 500,000 gallon tank appears to show an air-vent at the highest point on inlet line. This air-vent appears to be located on the outside of the tank. However, no details were provided. The intended purpose of this air-vent was not provided. It is not clear if it is for creating siphon-break. Please provide revised tank drawings showing the details of the air-vent as noted in the comment above.

24. The submitted construction drawings do not show whether the inlet to 500,000 gallon tanks is a dip-pipe type that terminates at the bottom of the tank or free-flow type near the top. Please provide revised tank drawings showing the details of the water inlet location and details (sizing, location, and shape). It must be free-flow type, and not a dip-pipe type as currently shown in the drawings.

25. The submitted construction drawings do not show whether the inlet and outlet ports on the 500,000 gallon tanks are located opposite to each other (at 180 degree angle to each other). Please provide revised tank drawings showing the details of the location of water inlet and outlet ports so that are at a 180 degree angle to each other (opposite to each other on the tank).

26. In the schematic drawing LC0.22 for the 10,000 gallon above-ground septic system holding tanks, a provision for over-flow was provided for all the tanks except for the last one. Where does the over-flow from last tank flow in the event of malfunction of the high-level alarm/controls? Is there a spill-containment surrounding all these tanks? Please provide clarification.

27. In the schematic drawing LC0.22 for the 10,000 gallon above-ground septic system holding tanks, details of the overflow appurtenances and their design features are not provided. They should be located such that the overflow of the second, third and fourth tanks should progressively be at lower location so that there is a cascading effect and no backflow. Please provide revised drawing showing the details of the appurtenances of these tanks and location of the overflows on these tanks with respect to ground level.

28. The submitted construction drawings do not show what the spill-containment design capacity is for the tanks systems must. Is it a minimum 110% or 125% of the largest capacity tank? The spill containment should be sized to contain water from a 100-year 24-hour precipitation event in addition to largest tank capacity. The TCEQ was not able to locate details in the submitted minor-amendment documentation or final construction documentation to verify size of the spill-containment for the tank systems.

Please provide calculations showing that the proposed dimensions of the spill-containment meet the above mentioned requirements. If not, please submit revised drawing and calculations meeting these requirements.

29. The BASF specification sheet for Sonoshield® HLM 5000® liquid, cold-applied elastomeric waterproofing membrane system does not specify useful applied life for the range of conditions expected

at the WCS site under the proposed use for moisture-barrier coating on canisters. Also, no procedures were provided on application and use of the waterproofing membrane system. Please provide the details on expected applied life that the elastomeric coating is designed for, as well as, the detailed procedures for its application on site.

VIII. Deficiencies Related to the Commencement of Major Construction

WCS states in the January 12, 2010 cover letter that "with approval of this minor amendment, WCS requests that TCEQ provide written approval of the final construction documentation submitted to TCEQ on June 29, 2009, in response to LC 63, and written authorization, in accordance with LC 74, for use of the revised list of codes and standards included in that June 29 submission." After the deficiencies described in this TNOD have been adequately addressed, the TCEQ can complete its evaluation for approval of commencement of major construction pursuant to LC 63.

In June 2009, WCS submitted construction documents for the agency's review. It is noted that the pending amendment application also relates to the final construction documents. Thus, it is appropriate to include pending issues related to the June 2009 submittal.

1. In meetings with the TCEQ, WCS has proposed adopting performance specifications for certain materials and equipment without an explanation of their equivalency or relationship to previous representations in the license application or as specified in license conditions.

Equivalency of any performance specifications must be demonstrated through certifications indicating that the final contractor design drawings meet the original intent of the design. These final contractor design drawings must also be submitted to the TCEQ for review and approval. Furthermore, the design must meet or exceed any commitments made in the application or any requirements specified by license condition and meet all applicable codes and standards for construction.

2. The legal description of the LLRW disposal facility has changed due to the proposed reconfiguration of the facilities. Accordingly, please provide an updated legal description with a metes and bounds survey map of the LLRW disposal facility. The description should include a metes and bounds survey map showing the current proposed configuration of the land disposal facilities including any easements for access and egress.

3. A detailed plan is needed to monitor the progress of construction and to allow for verification of geotechnical conditions in compliance with license condition 69. Please provide a detailed plan that includes specific criteria and frequencies for geotechnical testing during excavation and construction. The plan should also allow time for inspection by TCEQ at various stages of construction and establish specific conditions for ceasing construction and excavation if deemed necessary by TCEQ.

4. An updated waste acceptance plan is needed to understand how proposed changes to facility design will impact planned operations of the FWF and CWF. Please provide an updated waste acceptance plan.

A. Final Construction Documentation-Appendix A (Technical Specifications)

1. In Paragraph 2.1A of Section 31 05 19.13 on Geotextile; and Paragraph 2.2A, Section 33 46 16.16 on Geocomposite Drain, the ASTM D4751 mentioned is a test for apparent opening size rather than equivalent opening size. Please replace "Equivalent Opening Size" with "Apparent Opening Size" in the referenced paragraphs.

2. The paragraphs 1.1B and 1.1C of Section 31 05 19.16 on Geomembrane Liner, indicate that 20-mil HDPE geomembrane liners will be installed as part of the primary and secondary liner construction and as part of the storm retention. However, based on the Updated Engineering Report and Construction Drawings, these geomembranes will actually be 60-mil thick. A 20-mil HDPE geomembrane appears to have been added above the clay liner in the CWF, but its function is unclear as it is not referred to as a liner component in the Updated Engineering Report or shown on the Construction Drawings. However, if it were a liner component, a thicker geomembrane should be used because of the welding issues for thin HDPE geomembranes. Please revise the referenced paragraphs to address these inconsistencies and clarify that a 20-mil HDPE geomembrane is not being used as a liner component.

3. In the paragraphs 2.2 D and E of Section 31 05 19.16 on Geomembrane Liner, minimum values should be specified for all proposed geomembranes, which may include 60-mil smooth black HDPE geomembrane, 60-mil textured black HDPE geomembrane, 60-mil textured white HDPE geomembrane, and 20-mil smooth black HDPE geomembrane. The test methods presented in Paragraph 2.2 D are not compatible with the current situation as compared to the test methods listed in Paragraph 2.2 E and should be updated. Please revise this specification to include the requested information.

4. In paragraph 2.5 of Section 31.05.19.16 on Geomembrane Liner, minimum required peak and large displacement shear strength values should be specified. Please revise this specification to include the requested information.

5. Section 31 24 00 on Embankment includes the material and construction requirements for the low permeability red bed clay liner for the CWF and FWF. This specification and the CQA Plan should provide the technical information needed to construct the clay liner. However, the specification and CQA Plan provide significantly less detail than provided for the by-product material disposal facility. For example, the specification does not list the required hydraulic conductivity for the clay liner, does not require the length of the compactor pads sufficient to penetrate a lift of clay liner, or the procedures to follow if a field test does not go as planned. The specification should be revised to provide a level of detail for clay liner construction at least equivalent to that provided for the by-product material disposal facility.

6. The Paragraphs 3.2B and 3.2D of Section 31 24 00 on Embankment indicate that the clay liner material will be hydrated and compacted to a moisture content in the range of -4% to +1% of optimum. This moisture content range is much drier than the standard moisture content range for a compacted clay liner and than the ranges previously used to construct the clay liners for the by-product material disposal facility and the RCRA Subtitle C landfill at the WCS site. Please explain the difference of the specified moisture content range for the clay liner compared to the ranges described in the applications for adjacent facilities.

7. LC 69 requires that geotechnical studies, sampling, and laboratory analysis be conducted during excavation and construction to verify original geotechnical conditions. The testing program is not included in either the Section 31 23 16 on Excavation or CQA Plan. Please provide the testing program that will be performed by WCS during excavation as required by LC 69.

8. The Paragraphs 3.3C of Section 31 80 00 on Imported Materials specification requires that the sand or sand and gravel mixture placed as part of the leachate collection system be compacted to a minimum of 92% of standard proctor. However, Paragraph 3.6A of this specification lists relative density as the test method for drainage media. Please provide the testing program that will be performed by WCS during excavation as required by LC 69.

9. The Paragraph 2.1E of the Section 33 46 16.13 on Polyethylene Pipe, indicates that, unless noted otherwise, all pipe has a DR of 11 or 9. Drawings LC2.17, Section AC and LC2.26 show a DR of 7 for the slotted leak detection pipe. Please explain whether a DR 7 pipe will be used for the slotted leak detection pipe.

10. In Paragraph 2.2A of Section 33 46 16.16 on Geocomposite Drain, the requirements for 6 oz and 10 oz geotextiles should be deleted as only 16 oz geotextiles will be used in geocomposite drains. While Paragraph 2.2A indicates that the geotextile component of the geocomposite will be polyester and lists specified properties, Paragraph 2.3F of this specification indicates that the geotextile shall will meet the requirements in Section 31 05 19.13 (Geotextile), which specifies a polypropylene geotextile meeting different properties. Please revise this specification to indicate the required properties for the geotextile component of the geocomposite drain.

11. Paragraph 3.1A of Section 33 46 16.16 on Geocomposite Drain indicates that the geocomposite will be installed as part of the primary and secondary leachate collection system on the side slope and as part of the secondary collection system on the floor. However, the Construction Drawings and Updated Engineering Report indicate that the geocomposite will be installed as part of the primary collection system on the floor as well. Please revise this specification to indicate that the geocomposite drain will be installed as part of the primary and secondary leachate collection system on the side slope and floor.

12. The paragraph 3.1C of Section 33 46 16.16 on Geocomposite Drain, indicates geocomposite panels can be connected by spot welding or tying. Please provide information that indicates that spot welding is an acceptable method of joining geocomposite panels.

13. Non-Building Specifications, Section 03 30 00, Reinforced Concrete, Paragraph 2.1.A.1. Please define the applicable ASTM standard for silica fume, similar to what is shown for fly ash and ground granulated blast-furnace slag. Otherwise, delete silica fume reference in Paragraph 2.9.B.

14. Non-Building Specifications, Section 03 30 00, Reinforced Concrete, Paragraph 2.9.B: The wording for the 40 percent cementitious materials replacement is confusing. The specifications state a minimum of 80 percent of the Portland cement would have to be replaced by fly ash, which apparently is not the intent. Please revise the wording so that a minimum and maximum replacement amount is clearly defined for each of the three replacement material types (e.g. 15% minimum and 25% maximum for fly ash, etc.).

15. Building Specifications, Section 03 30 00, Cast-In-Place Concrete for Buildings, Paragraph 2.7.B: The wording for the 80 percent fly ash replacement is confusing. The specification states that a minimum of 80 percent of the Portland cement would have to be replaced by fly ash, which apparently may not be the intent. Please revise the wording to clarify, or delete the paragraph in its entirety since the allowable replacement amount is already covered in Paragraph 2.3.A.1.a.

B. Final Construction Documentation - Appendix E (Construction Quality Assurance Plan)

The QA/QC testing presented in Section 5 of the CQA Plan is not consistent with the facility design and the Technical Specifications. The CQA Plan lists some test methods and test frequencies that differ from the methods and frequencies presented in the Technical Specifications, and does not include hydraulic conductivity testing of granular soils to confirm that the sands and gravels utilized meet the values assumed for design as listed in the Updated Engineering Report (e.g., 1 × 10-4 cm/s for protective cover, 5 cm/s for pipe bedding gravel for the CWF, and 4.5 cm/s for pipe bedding gravel in the FWF leak detection system), and does not appear to include all the tests required by LC 71 (i.e., tests to generate

input parameters of infiltration computer models, HELP and VS2DI). The level of CQA provided for the CWF and FWF should be at least equivalent to that provided for the by-product material disposal facility.

Please update Section 5 of the CQA Plan to be consistent with the facility design and Technical Specifications. If the Technical Specifications are to include QA/QC testing requirements, the requirements given in the CQA Plan and Technical Specifications must be consistent. Furthermore, if the specified values are not provided in the CQA Plan, they must be provided in the Technical Specifications.

C. Final Construction Documentation-Appendix G (Engineering Construction Drawings)

1. In structural Narrative on page 70 of the Updated Engineering Report, the design spectrum response accelerations and seismic response coefficients for the seismic load that are listed don't match the values shown in the Structural General Notes on Drawing G.6. Please reconcile the values for seismic loads, the design spectrum response accelerations and seismic response coefficients.

2. The construction drawings for the CWF and FWF generally provide less detail than the construction drawings for the by-product material disposal facility (Disposal Cells A and B Earthwork, Byproduct Landfill, 27 April 2009) and need additional detail to clarify construction. For example, Drawings LC1.20 and LC2.31 show the conceptual location of the access roads into the CWF and FWF, but do not show specifically where the roads will be constructed, the intersection of the road and the temporary berm on the floor of the CWF, or account for the effects of the roads on drainage on the landfill floor and red bed ledge. The side slopes of the access road embankment are also not specified. Please provide construction detail and survey control for the CWF and FWF that is at least comparable to that provided for the by-product material disposal facility.

3. In drawings LC1.05, LC1.06, LC1.09, LC1.10, LC1.12, LC2.07, LC2.08, LC2.09, LC2.12, LC2.13, LC2.14, LC2.15, LC2.16, LC2.17, LC2.18, LC2.19, LC2.20, LC2.21, and LC2.22, the depth and shape of the ledge ditches shown on these drawings differs from those submitted with the Response to License Conditions 58C-D, and the ditches appear to have a smaller capacity than the required design capacities calculated in the Response to License Conditions 58C-D. Please provide a demonstration that the proposed ledge ditches are adequate or provide updated drawings with ditches that provide the design capacity calculated in the Response to License Conditions 58C-D.

4. In drawings LC1.08, LC2.11, and LC2.12, the ledge ditches do not appear to have the required capacity. It is not clear if the ditch systems for the CWF and FWF have sufficient capacity to contain stormwater from a 100-year, 24-hour rainfall event. Please provide a demonstration that the proposed ledge ditch systems are adequate or provide updated drawings with ditch systems that provide the required capacity. If groundwater is anticipated to be encountered in the construction of the ledges, please include updated drawings for ledge ditch liners.

5. Drawings LC1.06 and LC2.09 indicate that the ledge ditches will be located below the OAG and would overflow into the CWF rather than the OAG. In the event the OAG is locally lower than anticipated or that sandstone/siltstone from the Dockum formation is encountered in a ditch, the ditch systems may need to be modified to isolate the OAG or Dockum sandstone/siltstone from the water collected in the ditches. Please note that future revisions to the ditch systems may require a license amendment. Additionally, a revision to license conditions will be added that if groundwater is encountered in the construction of the ledge, the ledge ditches will be required to be lined to minimize the potential for infiltration.

6. Stormwater collected in the ditch systems should be removed promptly to reduce the potential for and extent of saturation of the red bed clay along drainage systems. Please provide more details on how

stormwater will be managed to reduce the potential for saturation of the red bed clay. If groundwater is anticipated to be encountered in the construction of the ledges, please provide a design for a liner.

7. If stormwater collected in the ditch systems is to be discharged as uncontaminated water, there should be no waste handling operations on the red bed ledge. Please confirm that any waste handling operations will be prohibited on the red bed ledge.

8. In Drawings SW1.01 and SW2.01, the sediment retention ponds for the CWF and FWF are located within the future construction areas of these facilities. These ponds will need to be relocated as the construction progresses. Please verify if your future construction plans account for these, and specify the precise proposed location, now and in the future.

9. Drawings LC1.04, LC1.10, LC1.12, LC2.06, and LC2.18 to LC2.22 indicate that reinforced concrete will be placed partially up the side slope of the disposal unit during initial construction. However, no explanation is given as to when the reinforced concrete should be extended further up the slope. Please provide the criteria that will be used by WCS to determine when the reinforced concrete will be extended up the slope and associated procedures.

10. The drawings show that the reinforced concrete layer will be underlain by a geocomposite drain. There is potential for the concrete to bleed into the geocomposite when the concrete is applied. Please provide evidence that the flow capacity of the geocomposite drain will not become adversely affected during installation of the reinforced concrete layer.

11. Drawings LC1.10, LC1.12, LC2.14 to LC2.16, and LC2.19 to LC2.22 show a 20-mil thick HDPE sacrificial liner over the geocomposite drain. This liner may be damaged by wind uplift unless it is secured. Please provide details on how the sacrificial liner will be secured on the side slope.

12. Figures 8 and 9 in Section 4.4.5 of Updated Engineering Report (Appendix F) show a 20-mil thick HDPE geomembrane on top of the low permeability clay liner for the CWF; however, this geomembrane is not shown on the referenced construction drawings LC1.10 to LC1.13. Please revise drawings to include the 20-mil HDPE geomembrane if this geomembrane is part of the liner system design.

13. Drawings LC1.12, LC2.20, and LC2.22 show a 20-in. diameter PVC pump-well installed in a gravel sump on the reinforced concrete. The pipe is shown as solid-walled and it is unclear how leachate will flow to the pump in the pump well. Please provide more detail on the operation of the pump well and leachate flow.

14. Drawings LC1.07 and LC1.11 include a detail of the sidewall leachate collection pipe trench section. However, the dimensions of the bottom of the trench differ: 6.8 feet on Drawing LC1.07 and 7.0 feet (i.e., 3.5 feet to the centerline) on Drawing LC1.11. Please revise the trench dimension to be consistent between drawings.

15. In Detail Y of drawing LC1.13 callouts for "Sand Drainage" and "Reinforced Concrete" need to be revised to point to the correct material, and Note 2 needs to be added or the callout for Note 2 needs to be deleted. Please correct these discrepancies.

16. Detail Y of Drawings LC2.16, Section AC of Drawing LC2.17, Drawing Detail AP of LC2.21, and Section AR of Drawing 2.22 do not appear to agree regarding the DR of the leak detection riser on the side slope. The DR of leak detection riser on the side slope is given a value of 11 on Drawings LC2.16 and LC2.21 and value of 9 on Drawings LC2.17 and LC2.22. Please revise the DR to be consistent between drawings.

D. Final Construction Documentation - Structural Comments:

1. Drawing LC0.23: Section B: There is a potential for delamination. Please commit to utilize doweling the plain concrete hump into the base slab to prevent delamination.

2. Drawing G.6, Structural Design Loads, Note #5: The estimated design base shear for the CWF Waste Staging Building is not listed. Please provide updated drawing with design base shear for the CWF Waste Staging Building.

3. Structural Design Loads, Note #5: "FWF Intermodal Staging Building" should be changed to "FWF Bulk Container Staging Building", typical 2 locations. Please submit revised drawings with above mentioned corrections.

4. Structural Design Loads: load criteria for the monorail crane in the CWF & FWF Decontamination Buildings is not provided. Please revise and add load criteria for the monorail crane in the CWF & FWF Decontamination Buildings.

5. Drawing G.7: Pre-engineered Metal Buildings, Note #3.D: The deflection limit for the monorail crane beam in the CWF & FWF Decontamination Buildings is not defined. Please define the deflection limit for the monorail crane beam in the CWF & FWF Decontamination Buildings.

6. Drawings S2.7 and S2.8: Change foundation and first floor plan title from "FWF Intermodal Staging Building Partial Foundation & First Floor Plan" to "FWF Bulk Container Staging Building Partial Foundation & First Floor Plan." Please submit revised drawings with above mentioned corrections.

E. Final Construction Documentation - Mechanical Comments:

There are 3 sets of the same Mechanical drawings in the project set. There is additional information in some sets when the same drawing is being compared. It is unclear what is being submitted for construction. Please resolve the above mentioned disparities and provide only one recent set that is consistent.

F. Final Construction Documentation - Laboratory Building:

1. In drawing M-0.01, the supply air to the lab space is shown as being re-circulated. Please confirm that this is intended. In general, lab space air is not re-circulated and should be avoided.

2. In drawing M-0.01, per equipment schedule for EF and MUA the equipments are rated for 960 CFM each. It is not clear how the negative pressure is maintained in the hood and general lab space. Please provide details on how the negative pressure will be maintained in the fume hood area and the general lab space.

3. In drawing M-0.02, if lab sink is used for chemical analysis, it is normally recommended that an acid neutralization tank is utilized before the contents go into a general drain system. Please explain how neutralization is achieved prior to disposal in general drain system.

4. In drawing M-0.02, it is indicated that the safety shower in the lab space shall be provided with tempered water. The design shows cold water being supplied to safety shower. Per ISEA Z358.1, tempered water shall be between temperature 60°F to 90°F. Please provide revised drawings giving details on the use of tempered water having temperature between 60°F to 90°F.

5. For drawing M-0.02, there are 3 sets of the same drawing in the package. One drawing shows the sanitary exit from the building to be forced through sump pump and the others show a gravity drain. Be specific and provide clear design intent for contractor (though LM0.2 has a note but is not a sealed document). Please resolve the above mentioned discrepancies and submit the corrected drawings.

G. Final Construction Documentation - Administrative Building:

1. In drawing M-0.03, the sequence of operations for the HVAC equipment is not provided. Please provide a definite sequence on how the VAV and the AHU will work together. It is highly recommended that a DDC system with an operator workstation be provided to assist the O&M in monitoring and adjusting set-points or for troubleshooting system.

2. In drawing M-0.03, the VAV box schedule is provided with the required contents. It is recommended that the minimum airflow through the VAV be at least 50% of the maximum airflow to avoid winter draft, provide enough throw and to provide required space ventilation air. The sequence of operation for the VAV should modulate the box to its minimum position upon a fall in space temperature, and upon a further fall in space temperature, the electric heating coil shall be staged to maintain the space setpoint temperature. Please provided revised drawing M-0.03 showing the above mentioned corrections and with detailed notes.

3. In drawing M-0.04, the plan shows the Fire Department Connection (FDC) is shown at the rear of the building. The FDC must be located at the main entry to the building and must be accessible by the fire truck. This location needs to be confirmed and coordinated with the local Fire Marshall/ Authority having proper jurisdiction. Please submit revised drawing M-0.04 and correspondence from the local authorities regarding compliance with local fire and emergency procedures, as well as other approriate documentation with above mentioned corrections.

H. Final Construction Documentation - Electrical Comments:

1. Appendix A: Codes and Standards. This section refers to a 2005 National Electrical Code. The 2008 code was adopted by Texas, effective September 2008. Please revise references to the National Electrical Code of 2008, and include a commitment to meet the current code at the time of construction.

2. In SED-4, one 6 strand fiber appears to be missing from the Gatehouse. Also the quantity of telephone cables past HH-15 should be corrected. Please submit revised SED-4 with the above mentioned corrections.

3. In SED-5, the following deficiencies are identified:

a) The normal power feeder to the fire pumps must have over-current protection sized to allow the locked rotor current for an indefinite amount of time. The fire pump circuit breakers are too small to allow this and do not meet NEC standards. Depending on the motor type, the locked rotor current of a 125 HP fire pump is 908 or 1171 Amps, and the current circuit breaker sizes are 800A. The emergency power breaker sizes meet code, but the designer should consider sizing these at 250% rather than 125% to ensure the continuity of power when the generators are running.

b) The feeder that serves both fire pumps appears to be undersized. It is not clear if the plan is to run only one fire pump at a time. The service entrance must be doubled in size if both of the fire pumps are capable of running at once.

c) The feeder size for dry-type transformer is incorrect.

d) The 400 A feeder between the generator and the GEN1 has two conflicting feeder designations.

e) SED-5 shows 125 hp pumps, but section 21 31 00 requires only 75 hp pumps. Please coordinate.

Please provide revised SED-5 with the above mentioned corrections.

4. Most facilities have two electrical services. One is a normal power utility service and the other is an emergency power source. The service disconnects for these services must have a permanent plaque denoting the services and services supplying the building as required by NEC 230.2(E). Please make the above mentioned corrections and submit revised drawings and documents.

5. In drawing E1.3, and all building one-lines, the size of the main feeder conductor that is being tapped at the emergency power disconnect does not match the size shown on the SED plans. Please explain this discrepancy or correct the conductor sizing and coordinate sizes with revised drawings.

6. In SED-5A, the one-line shows a single three phase circuit that runs out to three facilities. However the panel board schedule does not show any three phase circuit breakers to feed this feeder. It appears that there are three single pole breakers identified as "site distribution," but these are not appropriate to serve the site distribution needs. Please make these corrections and submit revised drawings and documents.

7. In SED-6, no provisions are shown to terminate the incoming telephone cabling. Also the primary protector assembly for the copper telephone wiring is missing. Please correct and submit revised drawings and documents.

8. Pertaining to the ES plans: the overhead lighting circuit wiring size is missing from the plans. Please correct and submit revised drawings and documents.

9. Pertaining to ES-05 and in general: some poles on ES-05 seem to show two light fixture symbols but only one is labeled as SL-3. Do these poles require two light fixtures? Also detail 2 – SED-2 is called out but no such detail exists. Please correct and address these issues and submit revised drawings and documents.

10. The electrical feed to the overhead lighting circuits is not clearly shown, and it is unclear whether it runs underground from the pole. If so, a weatherhead needs to be called out on the pole. If the conductors are run overhead to the buildings, then a weatherhead should be called out on the buildings. ES-02 seems to show an underground connection and ES-06 seems to show both an overhead and an underground connection to one of the buildings. Please correct and submit revised drawings and documents.

11. There is no legend for the ES plans. Therefore, it is difficult to determine what the symbols mean. Please add a legend. Also the poles are confusing. Some appear to be provided by the utility. It is unclear who provides the poles that are used only for lighting circuits. The same symbol is used for both. The height and type of poles for lighting should be defined because it appears they must be provided by the contractor. Please correct these issues and submit revised drawings and documents.

12. In drawing ES-06, there appears to be an overhead lighting circuit served from the Fire Pump house. However SED-6, SED-5 and spec 21 31 00 make no mention of providing any circuit for this exterior

lighting circuit. A lighting contactor would be required to resolve this. Also, an electrical service entrance from the utility company is missing on the site plan. Please correct these issues and submit revised drawings and documents.

13. Technical Specification Section 21 31 00 specifies a packaged unit including an enclosure. There should be a requirement that lighting, electrical convenience receptacles, and a wall mounted telephone be installed in this unit. Please correct and submit revised drawings and documents.

14. In drawing E0.03, the input wattage of the emergency fixtures should be 120V. The 12V rating applies to the output to the lamps via a ballast or internal transformer/rectifier. This is applicable to all buildings. Please make corrections to appropriate drawings for all buildings and submit revised drawings.

15. In drawing, E0.01, a mast with weather-head is needed for the service entrance cabling. There should be two masts with weather-heads. Please make corrections and submit revised drawings.

16. In drawing E0.03, the dry-type transformer ground connections are missing. Also the secondary ground cable is improperly sized. The Ground cable on the unprotected side of the transformer is required to be fixed per table 250.66 which requires a minimum of #8 Cu. This is assuming that the intent is to provide the ground connection at the dry-type transformer. Also, the ground connection to LAB1 should be shown. This is applicable to all buildings. Please make corrections to the appropriate drawings and documents for all buildings and submit the revised material.

17. In drawing E0.03, there are two service entrances to most buildings. Both the normal power and emergency power feeders to the building must be grounded in accordance with Article 250. The ground connections should be shown on the EM disconnect as well as the normal power service entrance panel to ensure proper grounding of the system. This is applicable to all buildings. Please make corrections to the appropriate drawings for all buildings and submit the revised material.

18. In drawing E0.03, many of the exhaust fan and small motor circuit breakers do not meet NEC requirements because they exceed 250% of FLA and exceed the size of the minimum recognized circuit breaker size of 15A. For the Lab building EF-3, 4 and BP-1 have 20A breakers feeding them, but the maximum allowed breaker is 15A. All buildings have this issue. Please make corrections to the appropriate drawings for all buildings and submit the revised material.

19. A Fire Alarm System is missing from the plans. Only a Fire Alarm Panel is shown on the plans, and a Fire Alarm specification is included in the package. Please submit the missing drawings and documents.

20. In drawing E0.06, the exit sign in front of room 113 should have an arrow. Also the Women's locker room should have an emergency light fixture similar to the men's locker. Please make corrections and submit revised drawing.

21. In drawing E0.1, a heat trace receptacle is shown but no general purpose receptacle is shown for maintenance. A general purpose GFCI receptacle should be provided. The heat trace circuit requires 30ma equipment protection. Typical receptacles have 8 ma protection, so it is likely to result in nuisance trippings. If a 30 ma GFCI receptacle were to be used, it may expose personnel to a hazard if used for general purpose since 30 ma protection is not sufficient to avoid shock with a potential for causing cardiac arrest. See comments below regarding heat trace. Please make corrections and submit revised drawing.

22. In drawings E0.01 and E0.07, the heat trace receptacles are shown for heat tracing. In one case a Ground Fault Weather proof receptacle which is fed from a 33 ma ground fault circuit breaker. Feeding a ground fault device from another ground fault device is improper. In another case, a standard receptacle is shown to feed from a 33 ma GFCI breaker. This does not safeguard personnel. Provide hard wired connections for heat trace circuits and serve them from 30 ma GFCI breakers. Also provide GFCI, WP convenience receptacles near outdoor equipment. If plug in heat tracing is still going to be used, the receptacle must have a cover that is weather-proof while-in-use. Also it would be best if a dedicated single receptacle was provided with a warning tag indicating that the receptacle shall not be used exclusively for heat tracing equipment. This comment is applicable for all heat trace receptacles. Please make these corrections and submit all applicable revised drawings and documents.

23. In drawing E0.09 Elevation 3, several L6-30P plugs are called out on the rack elevation but no 30A, 208V circuits are run to the racks. Please verify whether your current model will function and submit any pertinent information and diagrams demonstrating this. In the alternative, please submit alternate plans and attach any pertinent information and diagrams.

24. In drawing E0.09 Elevation 3, some of the switches and managers seem to be mislabeled. The 3750's should take up two RU's. Also, most new work is using Category 6 cabling. Cat 5e should not be used for new construction. Please make corrections and submit revised drawing.

25. Comment: In drawing E0.02, two details are shown for ground rod installations. The plan drawing, however, does not clarify where each rod must be installed. The rods should be installed in opposite corners in order to provide better maintainability. This is applicable for all lightning systems. Please make corrections and submit all applicable revised drawings.

26. In drawing E0.08, the telecomm ground is improperly sized. The ground cable for telecomm is required by EIA to be 3/0 if the cable is longer than 20' as is the case here. It is safer just to make the telecomm ground 3/0 on a standard detail like this to cover all situations. Please make corrections and submit revised drawings and documents.

27. In drawing E0.13,

a) Add a GFCI, WP receptacle near the outdoor equipment.
b) The bathroom receptacle needs to be GFCI.

Please make corrections and submit appropriate revised drawings and documents.

28. Comment: In drawing E0.14, a ground connection is missing from the Telephone panel to the main Electrical ground. This connection is required by EIA. Please correct and submit revised drawings and documents.

29. Comment: In drawing E1.1 and for all buildings: The overhead and underground tie in points to the exterior systems, shown on the ES plans, do not match the tie in points shown on the floor plans. For example, most of the tie-in points shown on E1.1 do not match the site plan. Also E1.1 makes reference to the wrong ES plan. Coordinate numbering between plans. This comment is in general applicable for all lightning systems. Please correct and submit revised drawings and documents.

30. The ES-01 sheet layout does not match the sheets. Please correct and submit revised drawings and documents.

31. In drawings E1.1, E1.6, E2.1, E2.14, E2.1A, and E2.6, the building does not appear to be air conditioned. There is a communications cabinet shown in the building which has equipment that may

require some air conditioning. An air-conditioned cabinet may be required. Also check the temperature ratings of the VFD's to see if cooling has to be address for those as well. Please make these corrections to all of the affected drawings and documents and submit the revised material. This requested action should include an explanation of the UPS, Switch and other equipment maximum temperature ratings.

32. In drawings E1.2, E2.1, and E2.2 the exterior copper cabling require Protected Entrance Terminals with primary protectors. These devices are not shown on the rack elevation plans. This is in general applicable to all other similar cases and drawings. Please make corrections to all affected drawings and documents and submit the revised material.

33. In drawing E1.8, the service entrance conductors are outdoor transformer secondary conductors. NEC 240.21(C) does not allow rounding up the capacity of conductors to the next standard rating. The service entrance conductors are undersized and need to be increased to 600kcmil. Please correct and submit revised drawings and documents.

34. In drawing E1.8, the size of the incoming ground cable is under-sized. It must be increased to 1/0 per table 250.66 of the NEC. Please make corrections and submit revised drawing.

35. In drawing E2.8, the service entrance conductors are undersized and need to be increased to 600kcmil. Please make corrections and submit revised drawings.

36. All of the buildings, except for the administrative facility and the Lab, are missing telephone connections. Each building should have one wall mounted phone jack for convenience and safety. Please make corrections and submit revised drawings and documents.

37. The Electrical Load Calculations were not provided in this package. Please submit the calculations.

38. In technical specification Section 26 05 05, there is no reference to the Arc-Flash study. It is recommended that an Arc-Flash study be added to this specification. Please make the above mentioned corrections and submit revised specification.

39. There are no specifications on level switches included in technical specification Section 26 0900 regarding Control Devices. The level switches are only mentioned by a model number on the drawings. Please make corrections and submit revised specification.

40. In technical specification Section 26 2913 concerning Motor Controllers, Paragraph 1.1B has an incorrect reference to Division 15 which does not exist. This is probably a carryover from the old specification format. Please correct this reference.

41. In technical specification Section 26 05 36-2.1.A, only the wire mesh tray is included in the drawings. In ES plans, no guy wires are shown at corners and ends of the overhead pole lines serving site lighting. Please correct and submit revised drawings and documents.

42. In technical specifications Section 26 21 00, the Overhead Electrical specification does not appear to be edited. The overhead electrical work on this project is poorly defined on the ES plans and in the specification referenced above. Most of the overhead electrical work appears to be provided by the utility so this work does not need to be defined. However there is an entire 480V overhead lighting system included in this contract which is poorly defined and appears inadequate for bidding. The height and type of poles is not defined, and the overhead conductor type and size are not shown. Also, some guy wires will be required along this secondary overhead system to meet NESC code and to avoid poles from

leaning over time. Typically, sag-tables or some definition of tension requirements are required for stringing overhead cables. Please make these corrections and submit revised drawings and documents.

43. In technical specifications Section 26 28 13, the 30ma GFCI breakers should be included in this specification for heat tracing circuits. Please make corrections and submit revised documents.

44. In technical specification Section 27 00 00, paragraph 2.2.C gives specifications for ladder trays but mesh trays are left out of the drawings. Please make corrections and rectify the discrepancy between drawings and specification and submit revised drawings and/or specifications.

45. In technical specification Section 27 00 00, paragraph 2.2.G, the first sentence makes a reference to the Sealpic PE-89 cable. This not a suitable choice for interior use as a horizontal cable. Delete the reference to the PE-89 cable. Please make corrections and submit revised specification.

46. In technical specification Section 27 00 00, the paragraph 2.2.O specifies multimode fiber optic cabling, but it does not appear to have been used anywhere. Please identify the drawings and locations where the multimode fiber optic cabling is used.

47. The drawings call out a Cat 3 telephone cable for outdoor use which could be misinterpreted as some other type of cable. The drawings should be modified to clearly require the PE-39 cable as listed in the technical specification in Section 27 00 00, paragraph 2.2.W. Please make corrections and submit revised drawings.

48. In technical Section 27 00 00, there are many components in this specification such as connector blocks and others that are not defined on the drawings. If interior wiring is required a refined description of the telecommunications system is required. Please make corrections and submit revised and /or additional specification and drawings.

49. Technical specification Section 27 51 16 provides specifications for the public address system, but there are no associated drawings or plans. There appear to be no drawings submitted which reference VFD. Please make the corrections and submit revised and /or additional specification and drawings.

50. There is a technical specification in Section 26 05 13 on medium voltage cables, but there was no reference to medium voltage cable on any of the drawings. Please submit drawings where these medium voltage cables are used.

51. The Communication Outlets shown on the plans appear to be empty outlet boxes with 1-inch conduit going up to the ceiling. The rack elevations patch panels are shown as Cat 5e, but these could be empty as well. However the specifications appear to require all Cat 6 cabling for horizontal wiring. Is interior cabling required? If so, then the plans should indicate how many RJ-45 jacks are needed at each outlet box and the elevation details need to include Cat 6 cabling. Please make the corrections and submit revised drawings.

52. In 2007 report on the WCS license application, a TCEQ consultant commented on HVAC VFD as follows:

> "M1.1, M2.1: Note 5 is not referenced on the plan. The note requires the VFD maintain a differential pressure of 0.01". In practice, this is difficult to maintain since it is such a small number. In addition, 0.01" is not enough of a differential pressure to ensure negative pressure everywhere in the building since the resulting velocities through door cracks, etc are so low. I recommend using 0.10."

Mr. Bill Dornsife of WCS responded to this comment through an electronic mail dated January 25, 2010 as follows:

> "WCS interpretation in regard to Attachment C. A. (12) of License R04100:
> Requirement A 12 of Appendix C of the LLRW License could be interpreted to require the speed control (VFD) on each exhaust fan speed for the main areas of the CWF and FWF staging building "be maintained at a differential pressure of 0.10 inches." Because the proposed exhaust system wasn't designed to do this, a number of design modifications would be necessary to make this possible. This License Condition, if it applies to the main areas essentially redefines the entire design basis for the exhaust system in the main areas of the staging buildings. WCS believes that this interpretation is neither necessary nor justified based on health and safety rationale. The HVAC system for the main portion of the LLRW staging buildings as proposed by WCS in the application and approved by TCEQ was not designed to monitor or control building pressure. For this reason, there are no pressure sensors to monitor differential pressure in the building areas where closed containers will be staged. The building exhaust trains for these areas were designed to maintain a preset (but adjustable) air flow rate when all doors are closed, then "ramp fan speed up to manufacturer's recommended maximum and close the intake damper louvers whenever any of the large doors are open." This was designed to be sequenced by relay control, meaning the VFD would increase speed when a position switch on any door signals the door is open. We did not propose to monitor or sequence HVAC speed based on a negative pressure setpoint.
>
> The exhaust system fans, ductwork, and electrical feeders are not sized to achieve anywhere close to the differential pressure setpoint specified by TCEQ. In order to achieve this setpoint, the exhaust fan/motor, duct sizes, VFD power rating, and electrical conductors to the VFD would all need to be significantly upsized, and the building may need to be redesigned, resulting a major unnecessary cost increase. There may be other impacts that are also unavoidable such as exhaust train size effecting traffic patterns and building/exhaust system inspection, test, and maintenance (ITM.) needs. WCS does not see any rational health and safety need for maintaining a 0.1 inch negative pressurization in areas where closed USDOT qualified containers are stored and moved.
>
> Active negative pressurization is not provided or required while similar containers are in transit or stored elsewhere on site. In the event of a container breach, it's unclear that high levels of turbulent airflow in the vicinity of the breach would be advantageous, quiescent air might be more a much more predicable condition for recovery.
>
> It is WCS's interpretation that this License Condition only applies to the enclosed sampling area on drawings M1.1. As described in the License application, this is the only area where containers will be opened and thus need to maintained at a prescribed negative pressure of 0.1 inches. Any other interpretation does not make any health and safety sense and would not be consistent with the requirements in our other licenses."

Response to WCS Comment: The noted TCEQ consultant's comment was based on a representation in the license application on a specification that indicated maintenance of differential pressure of 0.01 inch. The TCEQ comment was to indicate that the specification represented in the application would be difficult to maintain. If an alternative specification is being proposed, please provide a complete explanation of the requested change.